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Indian Standard

METHOD FOR TESTING EFFICACY OF FUMIGATION FOR DISINFESTATION OF GRAINS IN DOMESTIC BINS

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

METHOD FOR TESTING EFFICACY OF FUMIGATION FOR DISINFESTATION OF GRAINS IN DOMESTIC BINS

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Indian Standard

METHOD FOR TESTING EFFICACY OF FUMIGATION FOR DISINFESTATION OF GRAINS IN DOMESTIC BINS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 30 June 1975, after the draft finalized by the Storage Structures and Storage Management Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 Efficacy of a fumigant for its toxicity to insect pests in a storage bin is required to be evaluated for ascertaining proper disinfestation. Therefore, in order to make the fumigation operations more certain, comparative efficacy of various fumigants is tested. It is hoped that this Indian Standard will help in adopting a uniform procedure and interpretation of results.

0.3 The standard is based on the method generally followed by various Institutes and especially by the Indian Grain Storage Institute, Hapur.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes method for testing efficacy of fumigation for disinfestation of grains in domestic bins.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions of various terms given in IS : 6151 (Part I)-1971† shall apply.

*Rules for rounding off numerical values (revised).

†Storage management code: Part I Terminology.

3. APPARATUS

3.1 Gas Indicator — Gas Master, Gow Mac or Richen or any other suitable type.

3.2 Wiremesh Insect Cages

4. TEST FUMIGANTS

4.1 Ethylene Dibromide

4.2 Aluminium Phosphide Tablets

4.3 Ethylene Dichloride and Carbon Tetrachloride (EDCT) Mixture

5. PROCEDURE

5.0 The efficacy of a fumigant is evaluated at a dose that will normally produce lethal concentration of gaseous fumigant in the treated space during a specified duration of time or exposure period. Hence, various factors are taken into account while evaluating the efficacy of fumigation in a domestic bin.

5.1 Dose — Calculate the fumigant dose in bulk grain either on volume basis, that is, per m^3 or on mass basis, that is g/tonne of grain.

5.1.1 In case of indoor bin, ethylene dibromide may be used at the rate of 3 ml per quintal or at the rate of 60 g/m^3 . While in case of an outdoor bin, aluminium phosphide tablets at the rate of 6 g/tonne or 4.2 g/m^3 and EDCT mixture at the rate of 300 g/m^3 may be used.

5.2 Determine the concentration of gas fumigant in the volume of treated space in mg/m^3 , with the help of a gas indicator.

5.3 The exposure period or duration of fumigation time should be 7 days for the fumigants (see 4).

5.4 Major and minor pests which cause damage to the food grains during storage may be used for the tests. These pests may be rice weevil, lesser grain borer, *KHAPRA* larvae, red rust flour beetle, saw-toothed grain beetle, pulse beetle, grain moth larvae, etc. Usually red rust flour beetle and *KHAPRA* larvae may be used in the tests. Grain infested with larvae and pupae of borers should also be used for making the assessment.

5.5 Take specified number of these pests, say 50, in wiremesh insect cages containing the same grains with which the bin is filled. Insert these cages in the bin at different depths — top, middle and bottom — in the periphery and in the middle of the bulk grain. Fumigate the bin and after the above exposure period (see 5.3) count the mortality of insects.

6. TEST RESULTS

6.1 Express the result as percent kill. The fumigant, its dosage, application technique and the air-tightness of the bin shall be considered satisfactory, if mortality obtained is 100 percent.

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